Minutes of the Meeting of the Core Group of RuTAG IIT Delhi held on February 17, 2016 in the CRDT Committee Room, Block-III, Room No. 290, IIT Delhi

February 29, 2016

A meeting of the Core Group of RuTAG IIT Delhi was held on February 17, 2016 in the CRDT Committee Room, IIT Delhi under the chairmanship of Prof. R. R. Gaur. Following people were present:

- Prof. R. R. Gaur, Chairman, Core Group, RuTAG, IIT Delhi.
- Major S. Chatterjee, Senior Project Consultant and Member, Core Group, Scientific Consultant, Office of the PSA, Vigyan Bhavan Annexe, New Delhi.
- Prof. Rajendra Prasad, Co-PI, RuTAG, IIT Delhi.
- Dr. D. Raghunandan, CTD, New Delhi (NGO Expert)
- Prof. Sangeeta Kohli, PI of the project on “Improvement of Furnace for Bangles Making and Improving the Working Conditions of Artisans.”
- Dr. Jitendra P. Khatait, PI of the project on “Design of Treadle Pump using Solar Power.”
- Prof. Veena Koul, HOC, Centre for Biomedical Engineering, IIT Delhi.
- Mr. Raj Kumar Gupta, Senior Project Assistant, RuTAG, IIT Delhi.
- Mr. Davinder Pal Singh, Project Associate, RuTAG, IIT Delhi.
- Mr. Mangal Sharma, Project Attendant, RuTAG, IIT Delhi.
- Prof. S. K. Saha, Coordinator/PI and Convener, Core Group, RuTAG, IIT Delhi.

Prof S. K. Saha welcomed Chairman, Members of the Core Group and the participants with the permission of the Chairman, he started the proceedings of the meeting.

Agenda item No. 1: Confirmation of the minutes of the last meeting of the Core Group

The minutes of the meeting of the Core Group of RuTAG, IIT Delhi held on September 02, 2015 were already circulated to all the members/participants of the Core Group. No comment was received. Hence, the minutes of the last meeting were deemed as confirmed.

Prof. R. R. Gaur enquired about the proceedings of the Central RuTAG meeting held at the Office of the PSA on February 10, 2016. Prof. Saha told that Dr. R. Chidambaram has asked to draft a letter stating the probable ways for collaborating with Unnat Bharat Abhyan so that both RuTAG and UBA at all IITs could work together for the development of rural India. He also told that PSA has appreciated the RuTAG Club activities. Dr. D. Raghunandan and Major S. Chatterjee added that the whole idea behind the meeting at PSA was to bring upon with a solution for commercialization and bankability of technologies developed under RuTAG and O/o PSA.
A. Status of On-going Projects:

i. Improvement of Furnace for Bangles making and improving the working conditions of Artisans.
   PI: Prof. S. Kohli, Co-PIs: Prof. M. R. Ravi, Prof. S. K. Saha

   Prof. Sangeeta Kohli explained the various stages of fabrication and present status of development of the Bangles furnace in the Micro Model lab at IIT Delhi. She told that as soon as the furnace will get ready for testing, artisans from Bharatpur can be called for firing the furnace and testing of sitting arrangement and tools developed at Micro Model. Six months extension till July 31, 2016 was sought.

   **Decision:** The Chairman suggested that, the concerned NGO (Lupin Foundation) must be consulted to discuss the issue of the cost incurred for modifying the furnace and also for the commitment and assurance from the NGO to carry forward the technology developed. The extension till July 31, 2016 was agreed.

ii. Improving the Design of Bullock Driven Tractor to make it more users friendly.
   PI: Prof. Ajit Kumar, IGNOU

   As Prof. Ajit was unavailable, Prof. S. K. Saha told that BDT fabrication and required modifications of the lifting were completed and BDT firstly was tested using tractor in Micro model and secondly team of three persons Mr. Raj Kumar Gupta, Mr. Mangal Sharma and Mr. Tushar Goel visited Dahina village near Rewari, Haryana on December 11, 2015 to test the newly designed lifting mechanism for BDT. The testing at Dahina village was done using tractor as bullocks were not available due to some rituals on that date, therefore one more testing will be scheduled soon using bullocks at Dahina. An extension was required for 6 months.

   **Decision:** The Chairman suggested to consult various manufacturers and specifically the one in Bulandsehar to disseminate the developed technology. He also proposed to conduct a workshop in Bulandsehar to sensitize the manufacturers and farmers. The extension till July 31, 2016 was agreed.

    PI: Dr. Jatendra Kahtait, Co-PI: Viresh Dutta.

   Prof. S. K. Saha explained the need and background of the above said project. He told that the concerned NGO have lost interest in the project due do its internal uproar. Further, Dr. Khatait told that prototype of Solar Treadle pump sent by the IDEI was tested at various heads with two solar panels and constant DC power supply and results showed that output from solar panel is not constant as it is directly proportional to irradiance of sun therefore a battery or a controller is required for constant DC output. Hence additional components will add to the cost of the prototype sent IDEI which will
not remain an economical solution for the marginal poor unless an alternate design is explored or pondered upon.

In addition to the above said project, Prof. Saha mentioned that few modifications in the treadle pump were done using locally available hand pump parts such as piston connecting rod, plumbing accessories, non-return valves etc. The functioning of the treadle pump improved viz, required force to operate the pump, etc. so that one can even run the pump while sitting. He told that a project proposal to Petroleum Conservation Research Association (PCRA) for technology dissemination by manufacturing and installation of 200 improved treadle pump using locally available standard plumbing and hand pump parts developed under RuTAG is under consideration.

**Decision:** The Chairman strongly insisted to focus on the objective and the deliverables of the project. He indicated that real utility of the system must be studied from broader applications point of view. He also mentioned to conduct comprehensive tests for all the parameters.

iv. **Adaptation of Sheep-hair Shearing Machine Developed by IIT Delhi.**  
**PI: Prof. S. K. Saha**

Prof. S. K. Saha told the committee that two workshops were organized on March 03, 2015 at Rampur, Uttarakhand and during October 11-12, 2015 at Pipalkoti, Uttarakhand. Shearers appreciated the performance of the machine developed by IIT Delhi. A project proposal for indigenous manufacturing of complete set of motor, hand piece, flexible drive, comb and cutter etc. was also approved by CWDB, Jodhpur with a budget of 32.94 Lakh. Besides, the 2nd phase of the project under RuTAG is envisaged for six months where another training is expected to be held in the month of March 2016 at Rampur/Phata, Uttarakhand, with the locally made motor and flexible drive procured by RuTAG IIT Delhi.

**Decision:** Chairman appreciated the work and insisted on handing over few complete set of shearing machines to the NGO as a part of the 2nd phase of the project under RuTAG IIT Delhi.

v. **Design and Development of a Low Cost Ground Water Level Measuring Device.**  
**PI: Prof. A. K. Gosain (Deptt. of Civil Engineering)**

As Prof. Gosain was unavailable, Mr. Davinder Pal Singh explained various stages of modifications, fabrication and development of ground water levelling device and also compared and explained the modification undertaken with old (NGO’s device) and new (IIT modified). He mentioned that the device fabricated complies with the IS standard. He told that various wires with braided protection and without braided protection are under consideration for attachment to the device. He also told that fabrication of some
parts such as the electrodes and reels etc. are pending and will be completed soon. Prof. S. K. Saha added that Prof. Gosain and team have initiated the process for the procurement of the noncontact ground water measuring device from abroad and will be testing both the devices in one of the identified wells within the IIT campus. Later device will be tested in the field.

**Decision:** Chairman appreciated the work.

**B. New Project Ideas**

**i. Running D-G sets on organic fuels (Karanja Oil).**

Prof. S.K. Saha told that the problem was mentioned during the workshop at Ranchi and Prof. L. M. Das form IIT Delhi approached to undertake the above said problem and RuTAG staff has already in contact with him.

- Determine the critical temperature for most efficient operation and the tolerance range to be attained (e.g., Karanj needs 122-2 degree centigrade).
- Suitable preheating device with adjustable temperature range for whole range of oils.

**Decision:** Since Prof. Das has no prior experience in using the Karanja oil in diesel set, the project was dropped.

**ii. Iodization of Raw Salt for tribal population.**

Prof. Saha told that Mr. Raj Kumar and Mr. Davinder Pal Singh visited the salt commissioner office in Jhalana area in Jaipur and gathered information about the basic technologies involved in the manufacturing of Salt. Search for the expert is on within the IIT Delhi campus.

**Decision:** Prof. Saha will talk to the salt commissioner for further action.

**iii. Low cost Hemoglobin level Indicator for village health workers: Prof. Veena Koul.**

Prof. Saha mentioned that this problem was raised during a workshop at Ranchi. In preliminary investigations it was found that Prof. Veena Koul of CBME has already developed a device which is commercially available.

Prof. Veena Koul told that device has been developed by one of his student Ambar Srivastava who incubated and developed the prototype in TBIU unit under IIT and this device is commercially available. The device is cheap in comparison to the imported brands. Cost of the device is around Rs. 6000 and pack of 50 strips costs around Rs.375. She agreed to arrange a device for testing in the villages of Jharkhand and nearby States.

**Decision:** Prof. Koul will give one device to RuTAG

Prof. Gaur appreciated the work done by Prof. Veena Koul and his student. He told that a small program must be organised to gain the knowledge and to learn from the success story
of the technology developed in IIT Delhi so that it could become the source of inspiration to RuTAG projects.


Prof. Kohli told that she has developed and tested the LPG fired bell metal furnace in Konda village in the District of Chhattisgarh. The project was sponsored by DST in the year 2010. Mr. Satyendra Rana designed, fabricated, installed and tested this furnace at Konda village and in Micro Model lab at IIT Delhi as part of his M.S. thesis at IIT Delhi. Since he has completed his degree, to take up the project from where Mr. Satyendra left a team of three Prof. M R Ravi, Mr. Davinder and Mr. Satyendra will be visiting Konda village on February 27, 2016 to retrofit the furnace and to sensitize and inspire the artisans to use LPG based furnace which is less polluting, safe and user friendly. She mentioned that Kalamandir, an NGO, is also interested in developing and installing LPG fired furnace to make Dhokra craft in Jamshedpur. Therefore, artisans from Jamshedpur will be invited to observe the bell metal furnace at Konda village and after that RuTAG project could be taken up for the development of Dokra craft furnace.

Decision: Visit to Konda

v. Re-designing of Dari making Loom and ergonomically design seating arrangement.

Prof. S. K. Saha mentioned that he has already developed loom for carpet making during some time back and has all the expertise and now how to modify looms for dari making and it seating arrangement.

Decision: Get more details about the requirements

2. Reporting

i. Second RuTAG Club IIT Delhi orientation programme was organized on September 9, 2015. The Club aims to achieve a state where students can apply their knowledge and contribute to their nation with fun and joy.

ii. RuTAG IIT Delhi Regional workshop at Ranchi, Jharkhand (November 19-20, 2015) RuTAG IIT Delhi conducted a regional workshop on November 19-20, 2015 at Society for Rural Industrialization (SRI), Behind Doctor’s colony, Bariatu Ranchi, Jharkhand. The program was attended by about 34 participants from about 12 NGOs, 2 faculty members from Xavier Institute of Polytechnic and Technology Ranchi, 1 faculty member and 4 students form BIT Misra Ranchi.

iii. Sheep Hair Shearing Training Program at Pipalkoti, District Chamoli Uttarakhand on 11th and 12th October 2015. RuTAG IIT Delhi organized a Training Program on 11th and 12th October 2015, at Pipalkoti, District Chamoli, Uttarakhand, to train shepherds with Sheep Hair Shearing machine developed by IIT Delhi. The program was attended by around 18 participants which included 8 shepherds from
village Pipalkoti and Joshimath, 2 trainers from Sheep Breeding Farm Pipalkoti Chamoli, district, 2 officials Mr. Pan Singh Panwar, B.E.O, Mr. S.P. Nautiyal, L.E.O. from Uttrakhand veterinary department, and Dr. Lokesh Kumar from Department of Animal Husbandry, Pashudhan Bhawan, Mothrowala, Dheradhnun.

iv. RuTAG IIT Delhi **Field Visits Dahina village, Rewari, Haryana** on December 11, 2015  Mr. Raj Kumar Gupta, Mr Mangal Sharma and Mr. Tushar Goel from RuTAG IIT Delhi visited Dahina village, Rewari, Haryana on December 11, 2015 to test the newly designed lifting mechanism for Bullock Driven Tractor.

v. Women Empowerment by Technology supported manufacturing of beads from Holy Basil” during Dec. 2015 in Current Science Journal under special section of Design for well-being.

vi. Executive Committee meeting of CWDB meeting was held at CSWRI Campus, Avikanagar, Jaipur on January 20, 2016. Mr. Raj Kumar Gupta and Mr. Davinder Pal Singh has attended the meeting. Project has been sanctioned with the budget of 32.94 lakhs (Duration 12 months).

vii. Received an invite from Larsen and Toubro Nanha Power Limited at Rajpura, Punjab, Near Chandigarh for technological interventions for its CSR activities in 49 villages encompasses within 5 KM radius of the plant.

The meeting ended with vote of thanks.

(Prof. S. K. Saha)
Coordinator/PI, RuTAG IIT Delhi

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